

Sepam series 60



Sepam **series 60** is a family of **high performance** digital protection relays, for all public or industrial distribution network protection applications.

Characteristics

Conformity to standards

IEC 60255 - Protection relays	
IEC 60529 - Degree of protection	IP52 on front panel
IEC 60068 - Operating temperature	-25°C to +70°C (-13°F to +158°F)
EIA 364-65A - Conformal coated IIIA	

Certifications

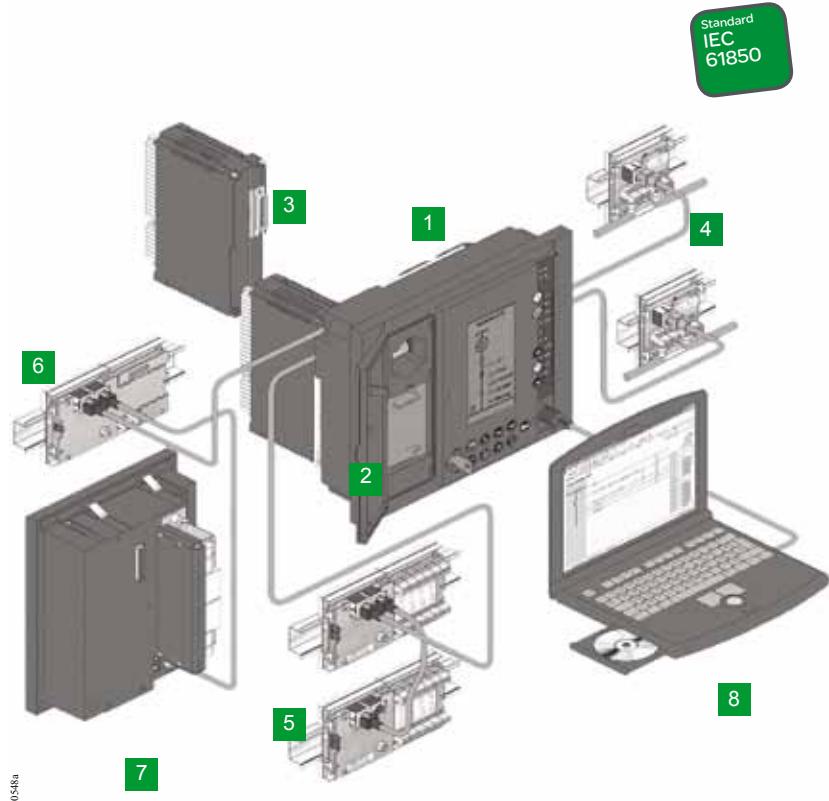
CE, UL508, CSA C22.2

Auxiliary power supply

24-250 V DC

Overall size of base units (H x W x D)

264 X 222 X 220 mm



Sepam series 60 and its optional modules

1 Base unit, with two types of User Machine Interfaces (UMI):

- Integrated mimic-based UMI
- Integrated or remote advanced UMI.

2 Parameters and protection settings saved on removable memory cartridge.

3 28 logic inputs and 16 relay outputs,

including 4 outputs on the base unit + 2 optional modules each providing 14 inputs and 6 outputs.

4 Until 4 communication ports + 1 front port:

- Integrated redundancy RSTP
- IEC 61850 and Modbus TCP/IP,
- Communication between relays with IEC 61850 GOOSE message,
- Modbus, Modbus TCP/IP,
- IEC 60870-5-103, DNP3 and IEC 61850, communication protocols (wire or fiber optic network),
- Synchronisation through Ethernet SNTP protocol.

5 Temperature data from 16 sensors, Pt100, Ni100, or Ni120.

6 1 analog output, 0-1 mA, 0-10 mA, 4-20 mA or 0-20 mA.

7 Synchro-check module

8 Software tools:

- Sepam parameter and protection setting and control function customization
- Recovery and display of disturbance recording data
- Local or remote operation via the front and back port.

Selection table

		Substation		Transformer		Motor	Generator		Cap.
Protection	ANSI code	S60	S62	T60	T62	M61	G60	G62	C60
Phase overcurrent ⁽¹⁾	50/51	4	4	4	4	4	4	4	4
Earth fault / Sensitive earth fault ⁽¹⁾	50N/51N 50G/51G	4	4	4	4	4	4	4	4
Breaker failure	50BF	1	1	1	1	1	1	1	1
Negative sequence / unbalance	46	2	2	2	2	2	2	2	2
Thermal overload for cables	49RMS		1						
Thermal overload for machines ⁽¹⁾	49RMS			2	2	2	2	2	
Thermal overload for capacitors	49RMS								1
Restricted earth fault	64REF			2	2				
Directional phase overcurrent ⁽¹⁾	67		2		2			2	
Directional earth fault ⁽¹⁾	67N/67NC		2		2	2		2	
Directional active overpower	32P		2		2	2	2	2	
Directional reactive overpower	32Q					1	1	1	
Directional active underpower	37P						2	2	
Phase undercurrent	37					1			
Excessive starting time, locked rotor	48/51LR/14					1			
Starts per hour	66					1			
Field loss (underimpedance)	40					1	1	1	
Overspeed (2 set points) ⁽²⁾	12					□	□	□	
Underspeed (2 set points) ⁽²⁾	14					□	□	□	
Voltage-restrained overcurrent	50V/51V						1	1	
Underimpedance	21B						1	1	
Undervoltage (L-L or L-N)	27	2	2	2	2	2	2	2	2
Positive sequence undervoltage	27D	2	2	2	2	2	2	2	2
Remanent undervoltage	27R	2	2	2	2	2	2	2	2
Overtvoltage (L-L or L-N)	59	2	2	2	2	2	2	2	2
Neutral voltage displacement	59N	2	2	2	2	2	2	2	2
Negative sequence overvoltage	47	2	2	2	2	2	2	2	2
Overfrequency	81H	2	2	2	2	2	2	2	2
Underfrequency	81L	4	4	4	4	4	4	4	4
Rate of change of frequency	81R	2	2			2	2		
Recloser (4 cycles) ⁽²⁾	79	□	□						
Thermostat / Buchholz ⁽²⁾	26/63			□	□	□	□	□	
Temperature monitoring (2x8RTDs) ⁽³⁾	38/49T			□	□	□	□	□	□
Synchro-check ⁽⁴⁾	25	□	□	□	□	□	□	□	
Control and monitoring									
Circuit breaker / contactor control ⁽²⁾	94/69	□	□	□	□	□	□	□	□
Automatic transfer sources (ATS) ⁽²⁾		□	□	□	□		□	□	
Load shedding / automatic restart ⁽²⁾						□			
De-excitation ⁽²⁾							□	□	
Genset shutdown ⁽²⁾							□	□	
Logic discrimination ⁽²⁾	68	□	□	□	□	□	□	□	□
Latching / acknowledgement	86	■	■	■	■	■	■	■	■
Annunciation	30	■	■	■	■	■	■	■	■
Switching of groups of settings		■	■	■	■	■	■	■	■
Adaptation using logic equations		■	■	■	■	■	■	■	■

The figures indicate the number of relays available for each protection function.

■ standard, □ options.

(1) Protection functions with 2 groups of settings.

(2) According to parameter setting and optional MES120 input/output modules.

(3) With optional MET148-2 temperature input modules.

(4) With optional MCS025 synchro-check module.

Selection table

	Substation		Transformer		Motor		Generator		Cap.
Metering	S60	S62	T60	T62	M61	G60	G62	C60	
Phase current I1, I2, I3 RMS	■	■	■	■	■	■	■	■	
Residual current Io, sum Io	■	■	■	■	■	■	■	■	
Demand current I1, I2, I3	■	■	■	■	■	■	■	■	
Peak demand current IM1, IM2, IM3	■	■	■	■	■	■	■	■	
Voltage U21, U32, U13, V1, V2, V3	■	■	■	■	■	■	■	■	
Residual voltage V0	■	■	■	■	■	■	■	■	
Positive sequence voltage Vd / rotation direction	■	■	■	■	■	■	■	■	
Negative sequence voltage Vv	■	■	■	■	■	■	■	■	
Frequency	■	■	■	■	■	■	■	■	
Active power P, P1, P2, P3	■	■	■	■	■	■	■	■	
Reactive power Q, Q1, Q2, Q3	■	■	■	■	■	■	■	■	
Apparent power S, S1, S2, S3	■	■	■	■	■	■	■	■	
Peak demand power PM, QM	■	■	■	■	■	■	■	■	
Power factor	■	■	■	■	■	■	■	■	
Calculated active and reactive energy (±Wh, ±VARh)	■	■	■	■	■	■	■	■	
Active and reactive energy by pulse counting ⁽²⁾ (± Wh, ± VARh)	□	□	□	□	□	□	□	□	
Temperature (2x8RTDs) ⁽³⁾			□	□	□	□	□	□	
Rotation speed ⁽²⁾					□	□	□		
Network and machine diagnosis									
Tripping context	■	■	■	■	■	■	■	■	
Tripping current Trip I1, Trip I2, Trip I3, Trip Io	■	■	■	■	■	■	■	■	
Phase fault and earth fault trip counters	■	■	■	■	■	■	■	■	
Unbalance ratio / negative sequence current Ii	■	■	■	■	■	■	■	■	
Harmonic distortion (THD)	■	■	■	■	■	■	■	■	
Current and voltage Ithd, Uthd	■	■	■	■	■	■	■	■	
Phase displacement 1, 2, 3	■	■	■	■	■	■	■	■	
Disturbance recording recorded	■	■	■	■	■	■	■	■	
Thermal capacity used	■	■	■	■	■	■	■	■	
Remaining operating time before overload tripping	■	■	■	■	■	■	■	■	
Waiting time after overload tripping	■	■	■	■	■	■	■	■	
Running hours counter / operating time			■	■	■	■	■	■	
Starting current and time					■				
Start inhibit time					■				
Number of starts before inhibition					■				
Cable arcing fault detection	■	■	■	■	■	■	■	■	
Apparent positive sequence impedance Zd	■	■	■	■	■	■	■	■	
Apparent phase-to-phase impedances Z21, Z32, Z13	■	■	■	■	■	■	■	■	
Third harmonic voltage, neutral point or residual					■	■			
Difference in amplitude, frequency and phase of voltages compared for synchro-check ⁽⁴⁾	□	□	□	□		□	□		
Switchgear diagnosis ANSI code									
CT / VT supervision	60/60FL	■	■	■	■	■	■	■	
Trip circuit supervision ⁽²⁾	74	□	□	□	□	□	□	□	
Cumulative breaking current	■	■	■	■	■	■	■	■	
Number of operations, operating time, charging time, number of racking out operations ⁽²⁾	□	□	□	□	□				
Additional moduls									
2 modules MET148-2 of 8 temperature sensor inputs. ⁽³⁾			□	□	□	□	□	□	
1 low level analog output - MSA141 module	□	□	□	□	□	□	□	□	
Logic inputs/outputs - MES114/MES114E/MES114F (10I/4O) module	□	□	□	□	□	□	□	□	
Communication interface - ACE949-2, ACE959, ACE937, ACE969TP-2, ACE969FO-2, ACE850FP, ACE850FO or ECI850	□	□	□	□	□	□	□	□	

■ standard, □ options.

(2) According to parameter setting and optional MES120 input/output modules.

(3) With optional MET148-2 temperature input modules.

(4) With optional MCS025 synchro-check module.

User Machine Interfaces

Two types of User-Machine Interfaces (UMI) are available for Sepam series 60 base units:

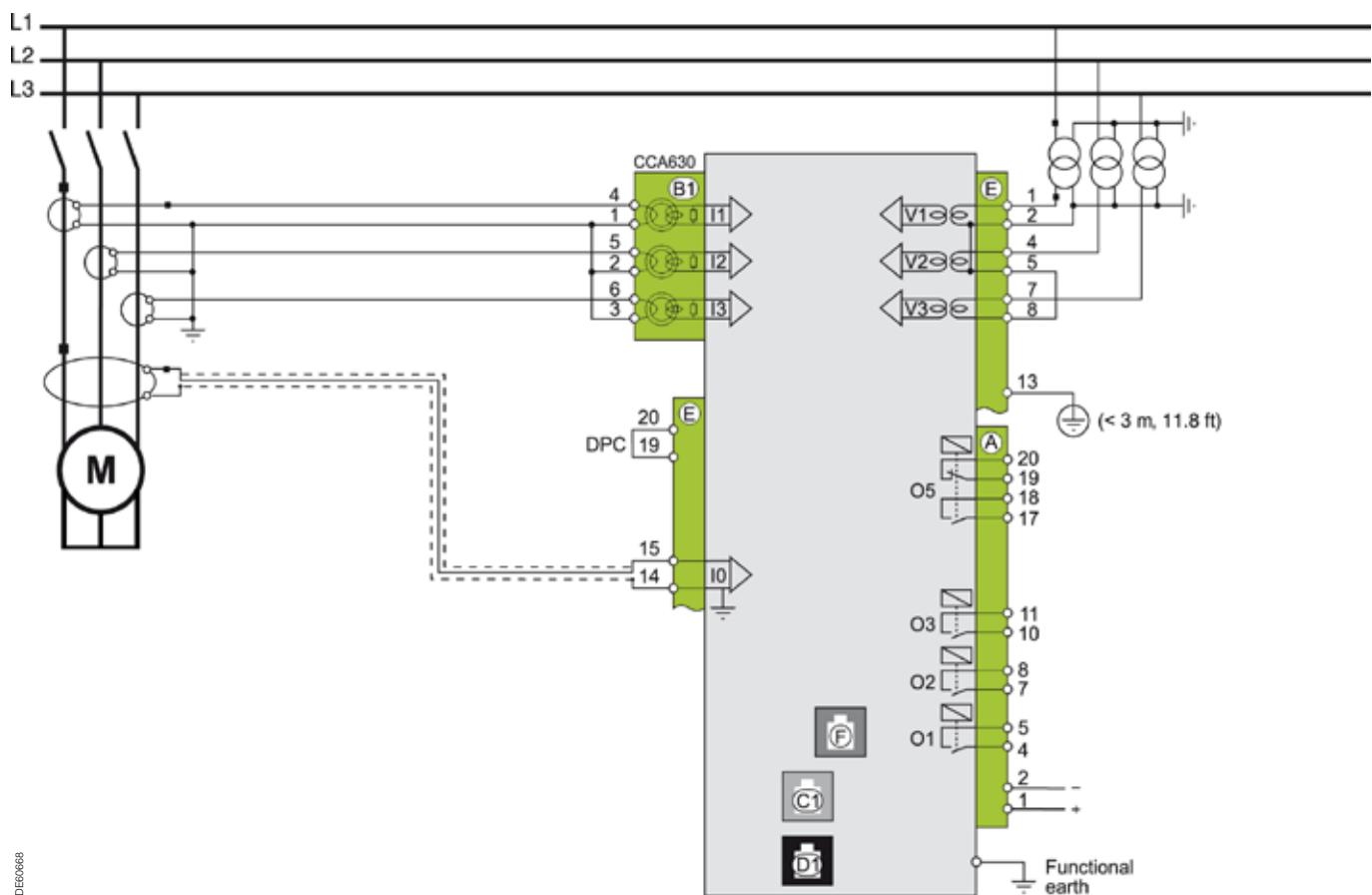
- Mimic-based UMI
 - Advanced UMI.

The advanced UMI can be integrated in the base unit or installed remotely on the cubicle. Integrated and remote advanced UMIs offer the same functions.

The image displays three Schneider Electric UMI (User Interface Module) models. From left to right:

- Integrated mimic-based UMI:** A black panel-mounted unit featuring a small LCD screen at the top showing a mimic diagram of a circuit breaker, with physical buttons and a dial below.
- Integrated advanced UMI:** A black panel-mounted unit featuring a larger color touchscreen display showing various graphical and numerical data, with physical buttons below.
- Remote advanced UMI:** A black remote unit featuring a color touchscreen display showing graphical and numerical data, with physical buttons below.

Sepam series 60 base unit



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